



ANTI EPILEPTIC DRUG UTILIZATION AND EVALUATION INPATIENTS

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Abstract:

Drug use evaluation (DUE) is a system of, ongoing, systematic, criteria-based drug evaluation that ensures the appropriate use of drugs. DUE data can be collected at national or regional level from the sources derived from quantitative or qualitative data, which makes it either prospective, concurrent or retrospective.

The steps of a DUE are:

Step 1: Establish responsibility, Step 2: Develop the scope of activities and define the objectives:

Step 3: Establish criteria for review of the medicine, Step 4: Data collection, Step 5: Data analysis, Step 6:

Feedback to the prescribers and planning of action and Step 7: Follow-up

Methodology: A Prospective drug utilization review study was conducted at inpatient department of Basaweshwar teaching hospital and general Hospital, Sedam Road, Kalaburagi. During the course of 08 months study from 10/7/2021 12/03/2022, all the epileptic and non-epileptic patients who were prescribed with AEDs except patients below the age of 18 years were enrolled in study. Data were collected from the prescriptions, case sheets, laboratory data, scan reports and diagnosis reports for information about demographic and use of AEDs.

Results And Discussion: During the period of 7 months, total 3000 patients were reviewed prospectively, out of which 173 patients were prescribed with AEDs in various disease conditions as a part of study. Among them, 115 (66%) were male and 58(34%) were female. During this study, we observed that highest number of patients receiving AED's were at the age of 35-42 years comprising of 36(20.8%), followed by 43-50 years range of 30(17.3%), 18-26 years range of 27(15.6%), 27-34 years range of 21(12.1%). Patients with generalized seizures accounts for maximum prescribing percentage of AED's which is 23%, followed by CVA-I 18.4%, Partial seizures 17%, CVA-H 14.4%, Head injury 11.5%, Status Epileptics 4.6% and others of about 9.8%. Patients with generalized seizures accounts for maximum prescribing percentage of AED's which is 23%, followed by CVA-I 18.4%, Partial seizures 17%, CVA-H 14.4%, Head injury 11.5%, Status Epileptics 4.6% and others of about 9.8%. In our study among all the AED's, Phenytoin was highly prescribed (58.3%), followed by Magnesium Valproate (14.4%), Gabapentin (12.1%), Sodium Valproate (10.4%), Fosphenytoin (7.5%) and Valproic Acid (6.3%).

Conclusion: A total of 173 patients were prescribed with AED'S for the prophylaxis and treatment of Epileptic and Non-Epileptic seizures. During the study, population demographic data found the predominance of male over female. The drug utilization of AED'S was high in the age group 35-42 years. Patients with Head Injury and Generalized Seizures are the most prominent, explaining the unique drug utilization profile of AED'S in the study. Of 173 patients enrolled, 69% of patients with seizures were managed with Monotherapy, 26% with dual therapy and 5% with triple therapy. Considering all AED'S prescribed irrespective of Monotherapy, Dual therapy, Triple therapy, Phenytoin (58.3%) was highly prescribed, followed by Magnesium Valproate (14.4%), Gabapentin (12.1%), Sodium Valproate (10.4%), Fosphenytoin (7.5%), and Valproic acid (6.3%).

Keywords: Epileptic, AED'S, Monotherapy.

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INTRODUCTION:

Drug use evaluation is a system of, ongoing, systematic, criteria-based drug evaluation that ensures the appropriate use of drugs. The information obtained is used to identify problems related to drug use and also provides a means of correcting the problem and thereby contributes to rational drug therapy. DUE, also known as drug utilization review (DUR) is structured to assess the process of prescribing, dispensing or administering a drug. It is used to optimize drug treatment and document the extent of inappropriate prescribing of drug activities by comparing the approach of treating the diseases.¹

DUE data can be collected at national or regional level from the sources derived from quantitative or

qualitative data, which makes it either prospective, concurrent or retrospective.^{1,2}

The steps of a Drug Use Evaluation are:³

Step 1: Establish responsibility

Step 2: Develop the scope of activities and define the objectives:

Step 3: Establish criteria for review of the medicine

Step 4: Data collection

-Retrospectively

-Prospectively

Step 5: Data analysis

Step 6: Feedback to the prescribers and planning of action

Step 7: Follow-up

Criteria	Statements
Uses	Appropriate indication for drug, absence of contraindications
Selection	Appropriate drug for clinical condition
Dosing	Indication-specific dosing, space and duration of treatment
Interactions	Absence of drug-drug interactions and drug-food interaction.
Preparation	Steps involved with preparing a drug for administration
Administration	Steps involved in administration, quantity dispensed
Patient education	Drug and disease-specific instructions given to patients
Monitoring	Clinical and laboratory
Outcome	Decreased blood pressure, blood glucose, asthma attacks

Table 1: Criteria of Drug Use Evaluation

Epilepsy is a relatively common group of neurological disorders that involve recurrent seizures. Seizures are the result of excessive and abnormal nerve cell activity in the cortex of the brain.⁴ Treatment is initiated with one antiepileptic drug (monotherapy) followed by polytherapy. The intervening goal of treatment is to select an

effective drug with the least possible side effects. Rational drug use enables long term treatment with fewer side effects, no drug interactions, better tolerability, improved drug compliance and better quality of life and promote most appropriate drug for therapy.³

Older AED's	Newer AED's
➤ Phenytoin	➤ Felbamate
➤ Phenobarbital	➤ Gabapentin
➤ Carbamazepine	➤ Lamotrigine
➤ Primidone	➤ Oxcarbazepine
➤ Ethosuximide	➤ Topiramate
➤ Valproic Acid	➤ Tiagabine
➤ Diazepam	➤ Levetiracetam
	➤ Zonisamide

Table 2: Classification of AED's

Drug	Acute Side Effects		Chronic Side Effects
	Concentration Dependent	Idiosyncratic	
Carbamazepine	Diplopia Dizziness Drowsiness Unsteadiness	Blood dyscrasias Rash	Hyponatremia
Gabapentin	Dizziness Fatigue Somnolence Ataxia	Pedal edema	Weight gain
Lamotrigine	Unsteadiness Diplopia Headache	Rash	
Levetiracetam	Sedation Behavioral disturbances		

Phenobarbital	Hyperactivity Sedation Ataxia Unsteadiness	Blood dyscrasias Rash	Behavior changes, Intellectual blunting, Metabolic bone disease Mood change, Connective tissue disorder.
Phenytoin	Behavior changes Incoordination Lethargy Cognitive impairment Nystagmus	Immunologic reaction Rash Blood dyscrasia	Skin thickening, Hirsutism, Cognitive impairment, Metabolic bone disorder, Cerebellar syndrome.
Valproic acid	Gi upset Tremor Unsteadiness Sedation	Acute hepatic failure Acute pancreatitis Alopecia	Polycystic ovary like syndrome, Weight gain, Hyperammonemia, Menstrual cycle irregularities.

Table 3: Side Effects of Anti Epileptic Drugs**MATERIALS AND METHODS****METHODOLOGY**

Study Site: The proposed study was conducted at inpatient department of Basaweshwar teaching hospital and general Hospital, Sedam Road, Kalaburagi, Karanataka.

Study Design: Prospective observational study.

Study Period: The study was carry out over a period of 7 months, from Basaweshwar teaching hospital and general Hospital, Sedam Road, Kalaburagi. During the course of 08 months study from 10/7/2021 12/03/2022.

Study Criteria:**Inclusion Criteria:**

1. All the patients admitted as in-patients whose medication chart contains no less than one anti epileptic drug.
2. All the patients who are on adjunct therapy for epilepsy.

Exclusion Criteria:

1. Patients below the age of 18 years.

Study Procedure:

All the inpatients who were admitted in the hospital were reviewed and the patients who were meeting the inclusion criteria were enrolled in the study. Demographic details of the patients, diagnosis, treatment advised were documented in

the form, from the sources available. Medications administrations in these patients were followed up on daily basis by ward round participation to evaluate the usage of Anti Epileptic Drugs.

Source of Data:

1. From patient and patient care giver demographic data can be obtained.
2. From the prescription order by the physician, Medication details can be obtained.

From the case sheets, laboratory data, scan reports and diagnosis details can be obtained.

RESULTS AND DISCUSSION:

During the period of 7 months, total 3000 patients were reviewed prospectively, out of which 173 patients were prescribed with AEDs in various disease conditions as a part of study. Among them, 115 (66%) were male and 58(34%) were female. During this study, we observed that highest number of patients receiving AED's were at the age of 35-42 years comprising of 36(20.8%), followed by 43-50 years range of 30(17.3%), 18-26 years range of 27(15.6%), 27-34 years range of 21(12.1%). Patients with generalized seizures accounts for maximum prescribing percentage of AED's which is 23%, followed by CVA-I 18.4%, Partial seizures 17%, CVA-H 14.4%, Head injury 11.5%, Status Epileptics 4.6% and others of about 9.8%.

Age group	No. of patients prescribed with AED's	Percentage
18-26	27	15.6
27-34	21	12.1
35-42	36	20.8
43-50	30	17.3
51-58	17	9.8
59-66	18	10.4
67-74	12	6.9
75-82	9	5.2
83-90	2	1.7

Table 4: Distribution of patients according to age groups

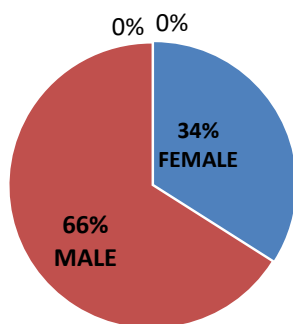


Figure 1: Sex Distribution of patients

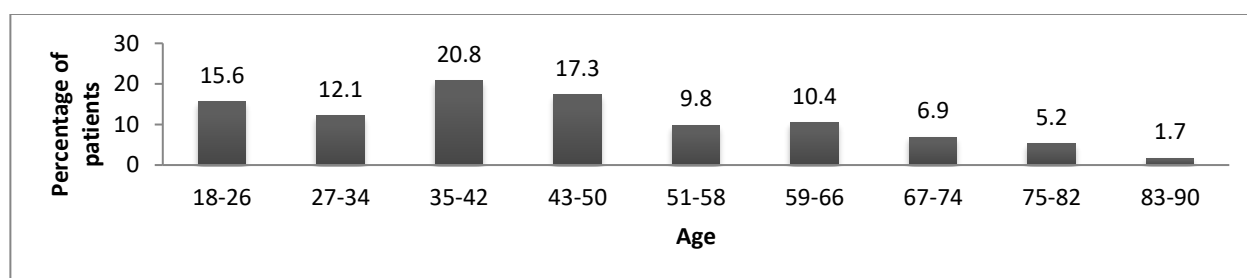


Figure 2: Percentage of different Age group patients prescribed with AED's

Patients with generalised seizures accounts for maximum prescribing percentage of AED's which is 23%, followed by CVA-I 18.4%, Partial seizures

17%, CVA-H 14.4%, Head injury 11.5%, Status Epileptics 4.6% and others of about 9.8%.

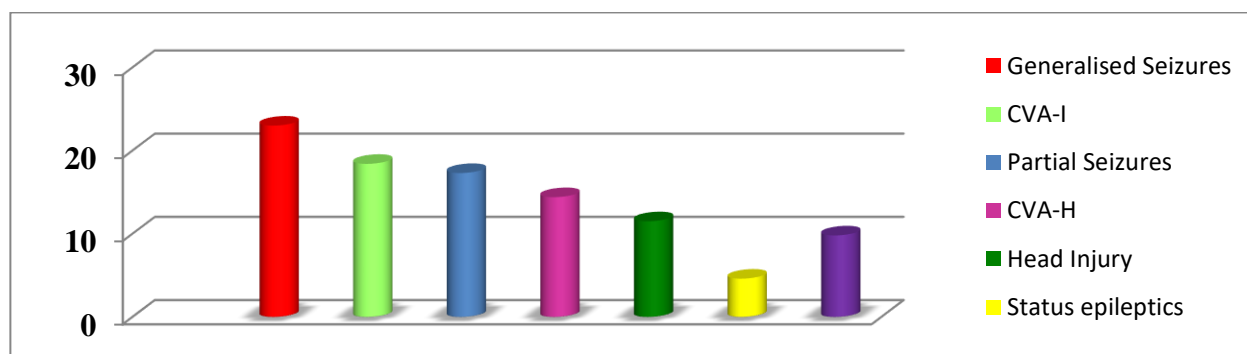


Figure 3: Percentage of patients prescribed with AED's among various diseases

- 1. Generalized Seizures: 41(23%)**-In group of patients suffered with Generalized Seizures, 78% were prescribed with Monotherapy, 14.6% were prescribed among Dual Therapy and 7.3% were prescribed with Triple therapy. In the Monotherapy, Phenytoin be the most often prescribed drug of 41.4% and then Magnesium Valproate of 17%, followed by Valproic acid(9.7) and Sodium valproate(7.3). In the Dual Therapy, combination of Sodium valproate and Clobazam was prescribed for about 9.7%.
- 2. Cerebro Vascular Accident- Ischemic (CVA-I): 32(18.4%)** Amongst the patients diagnose with CVA-I, AED's were prescribed as prophylaxis for seizures. 65.6% of patients were prescribed with Monotherapy of which most

frequently used drugs were Phenytoin (28.1%) and Gabapentin (21.8%). 31.2% of patients were prescribed with Dual therapy. Combination of Phenytoin and Clobazam drugs were highly prescribed of 15.6%, followed by combination of Sodium valproate and Clobazam of 12.5%. Phenytoin was the most prescribed drug when compared with other AED's irrespective of Mono, Dual and Triple therapy; comprising of 46.8%, followed by Gabapentin 28.1%.

- 3. Partial Seizures: 30(17.3%)** In the group of patients diagnosed with Partial Seizures, 56.6% were given with Monotherapy, 36.6% were prescribed with Dual Therapy and 6.6% were prescribed with Triple therapy. In the Monotherapy, Phenytoin was the most

commonly prescribe drug of 52.9% and then Magnesium Valproate of 41.1%, followed by Valproic acid 5.8%. In the Dual Therapy, combination of Phenytoin and Clobazam was about 36.6%; Sodium valproate and Clobazam was prescribed for about 27.2%.

4. Cerebro Vascular Accident (CVA-H):25(1.4%) Among the CVA-H patients prescribed with AED's, highest prescribing pattern was Monotherapy of 64%, followed by Dual therapy 24% and Triple therapy of 12%. In the Monotherapy, Phenytoin comprised of maximum usage of 50% and Gabapentin of 43.7%. In the Dual therapy, Combination of AED, Phenytoin and Clobazam was highly prescribed (83.3%).

5. Head Injury: 20(11.5%) In the 90% of patients with Head Injury, Monotherapy was recommended for prophylaxis of seizures,

which constitutes 40% of Fosphenytoin, 25% of Phenytoin and 20% of Valproic acid. Among all the AED's, Phenytoin was the mainly recommended and effective drug for prophylaxis of PTS.

6. Status Epileptics: 8(4.6%) In the patients identified with Status Epileptics, 75% of them were prescribed with dual therapy which comprised highest combination of Sodium valproate (50%) and Clobazam (37.5%). In this study Sodium Valproate and Phenytoin were highly prescribed of 37.5% along with the adjuvant Clobazam 62.5%.

7. Others: 17(9.8%) In the other conditions like Alcohol withdrawal seizures, Metabolic Encephalopathy, Drug withdrawal seizures, Idiopathic epilepsy, Phenytoin was most frequently prescribed as monotherapy of about 64.7%.

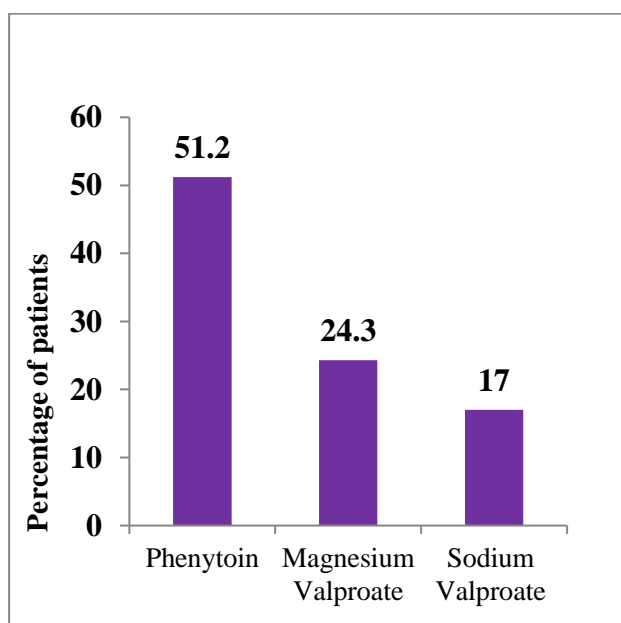


Figure 4: Comparison between various AED's Prescribed in generalized seizures patients

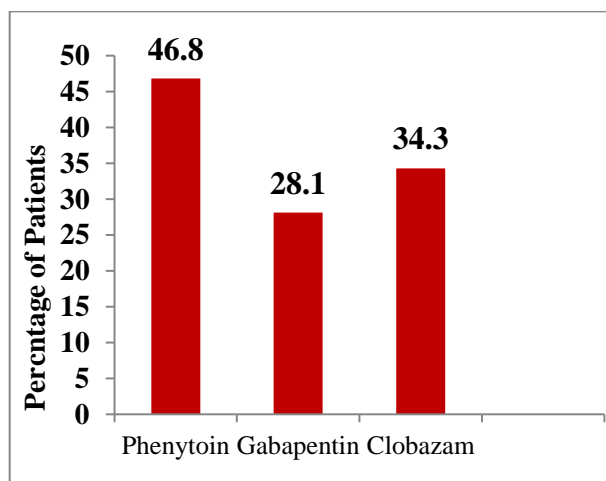


Figure 5: Comparison between various AED's Prescribed in CVA-I patients

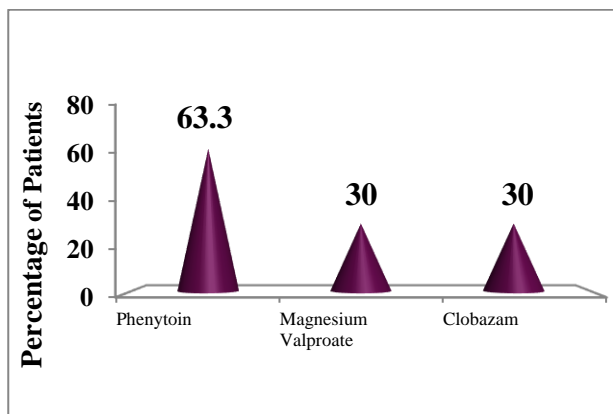


Figure 6: Comparison between various AED's ADE's prescribed in Partial Seizures patients

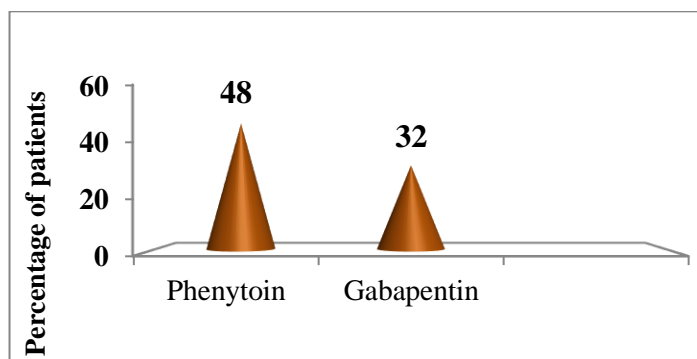


Figure 7: Comparison between various ADE's prescribed in CVA- H patients

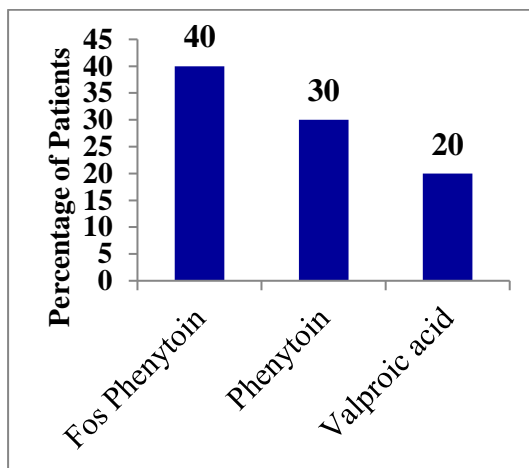


Figure 8: Comparison between various AED's prescribed in Head Injury patients

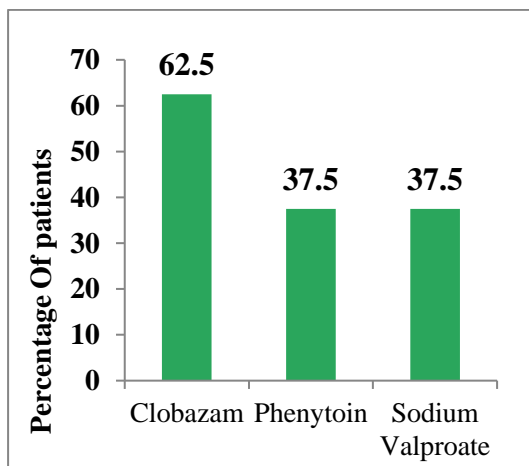


Figure 9: Comparison between various AED's prescribed in Status Epileptics patients

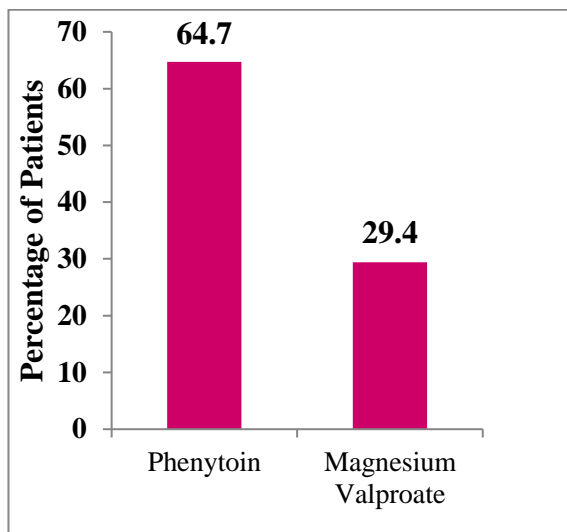


Figure 10: Pattern of AED’s prescribed

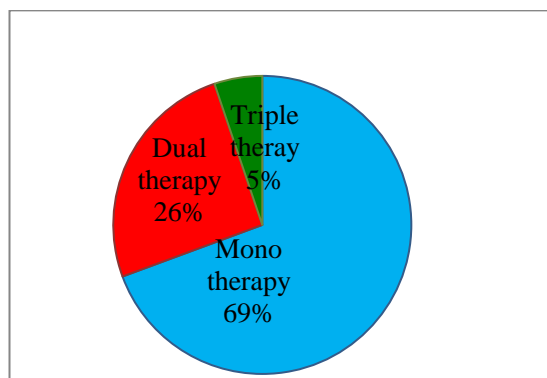


Figure 11: Comparison between various AED’s prescribed

In this study population, 120 (69%) of patients were prescribed with AED as Monotherapy and

Dual therapy of 44 (25.4%) patients, Triple therapy of 9 (5.2%) patients.

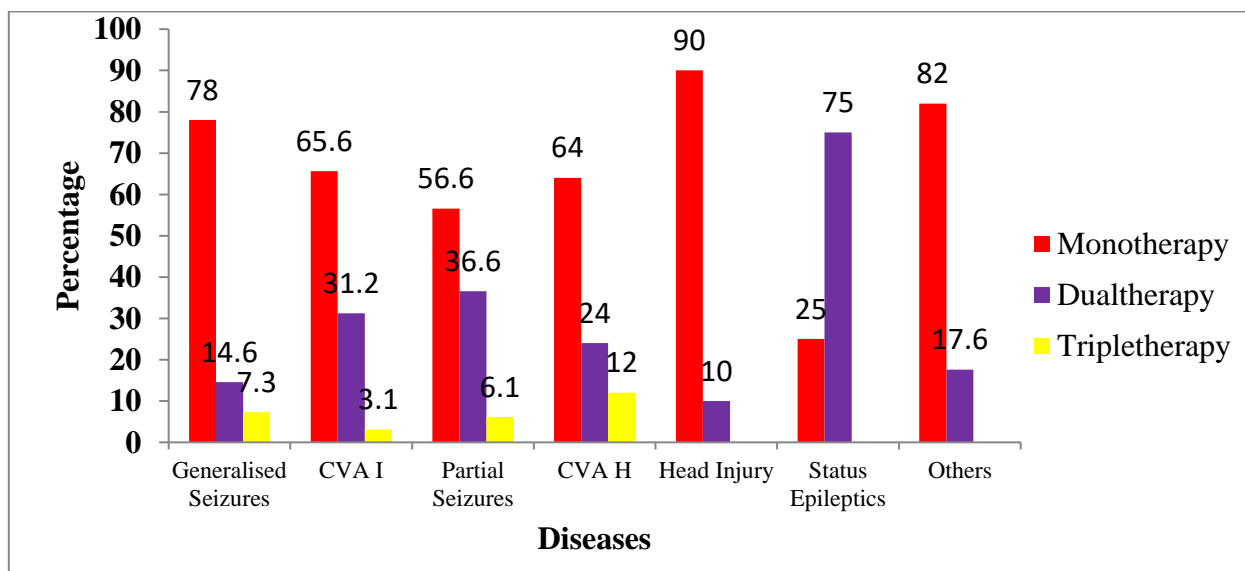


Figure 12: Percentage Distribution of mono/dual/polytherapy of AED’s in different diseases

In our study among all the AED’s, Phenytoin was highly prescribed (58.3%), followed by Magnesium Valproate (14.4%), Gabapentin

(12.1%), Sodium Valproate (10.4%), Fosphenytoin (7.5%) and Valproic Acid (6.3%).

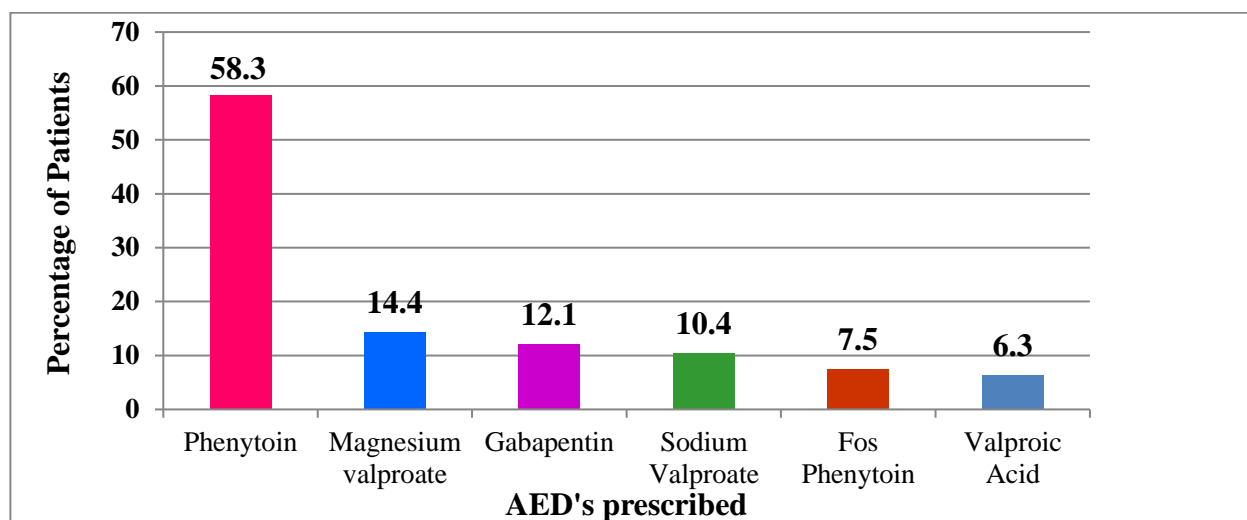


Figure 13: Comparison of various AED's prescribed

CONCLUSION

A total of 173 patients were prescribed with AED'S for the prophylaxis and treatment of Epileptic and Non-Epileptic seizures. During the study, population demographic data found the predominance of male over female. The drug utilization of AED'S was high in the age group 35-42 years. Patients with Head Injury and Generalized Seizures are the most prominent, explaining the unique drug utilization profile of AED'S in the study. Of 173 patients enrolled, 69% of patients with seizures were managed with Monotherapy, 26% with dual therapy and 5% with triple therapy. Considering all AED'S prescribed irrespective of Monotherapy, Dual therapy, Triple therapy, Phenytoin (58.3%) was highly prescribed, followed by Magnesium Valproate (14.4%), Gabapentin (12.1%), Sodium Valproate (10.4%), Fosphenytoin (7.5%), and Valproic acid (6.3%).

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